

An Enterprise Computational System Built on the Optimization Services (OS) Framework and Standards

- Real World Computational Application
- Distributed System
- Completely based on OS Standards

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OUTLINE

1. Introduction
2. Illustration
3. Business Values



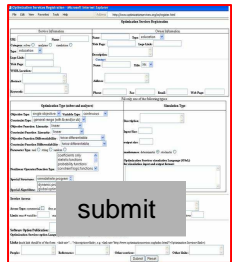
Introduction

- Customer used to run legacy computational work on desktops
- Need to run computational jobs on remote servers
- Need renovation using modern distributed technologies
- Jobs take long time
- Have close to 20 dedicated computational servers
- Users submit their work using some exiting Web GUI (ASP page)
- Need a centralized system where all jobs go through a scheduler
- Need the scheduler to keep track of all the 20 individual servers



Optimization Services (OS) Enterprise Computational System

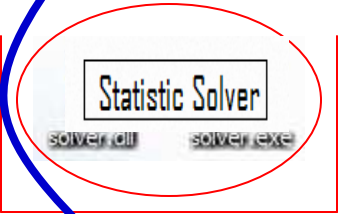
Web Form



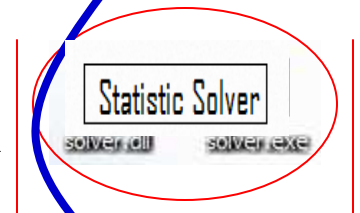
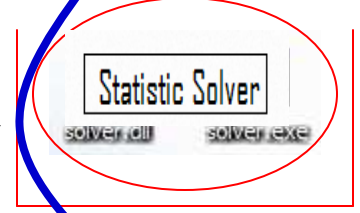
Modeling
Language/GUI/Spread Sheet

OSsL

OShL



OSServer



Representation

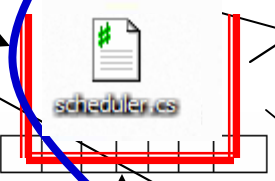
OSiL - instance

OSoL - option

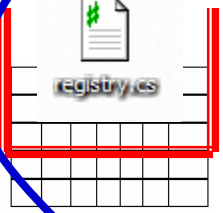
OSrL - result

OSpL - process

OShL



OSdL



Communication

OShL - hookup

OSdL - discover

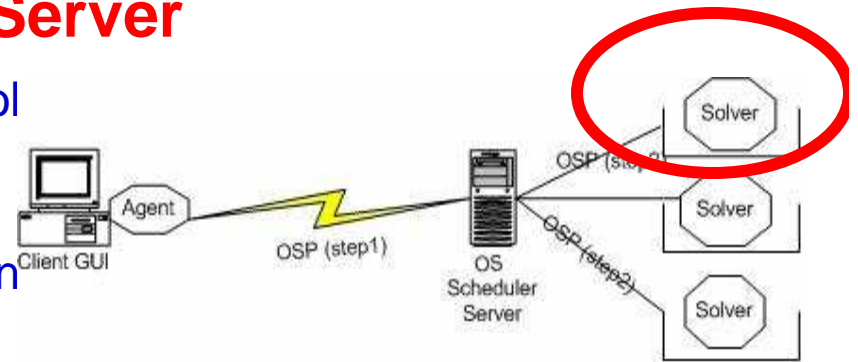
- getJobID (String OSoL)
- solve (String OSsL String OSoL)
- send (String OSsL String OSoL)
- retrieve (String OSoL)
- kill (String OSoL)
- knock (String OSpL, String OSoL)

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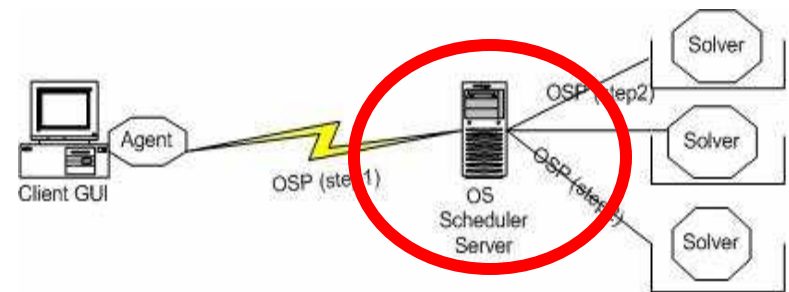
OS SOLVER Server

- Remote job submission, management and control
- Remote retrieval of previously submitted jobs
- Session and state maintenance
- Synchronous and asynchronous solver invocation
- Killing long jobs over the remote server
- Checking and managing service status and job statistics
- Automatic job completion notification via most common protocols including emails
- Persistence between service starts
- Service logging
- Automatic notification of critical service information to admin
- Centralized user configuration
- Directory and file cleanup
- Disk, memory and process cleanup
- Critical data backing up
- Waiting job queue management
- Long computational job handling
- Job dependency handling
- Keeping track of service utilization and preparing periodic report
- Automatic input and output validation and processing
- Support of machines with multiple CPUs
- Support of all major operating systems
- Authentication and authorization
- Security



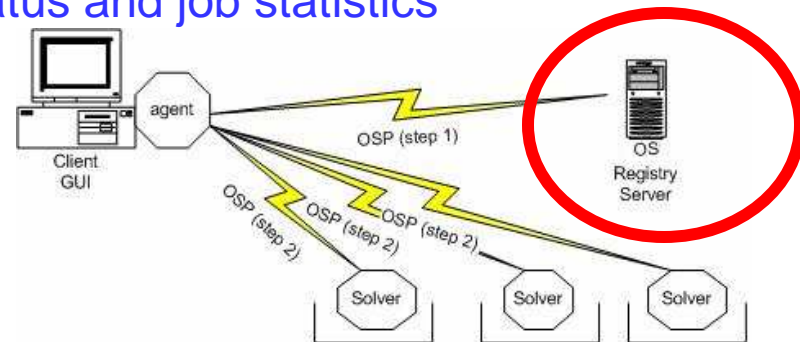
OS SCHEDULER Server

- Most functionalities that a solver server would have
- Keeping track of potentially unlimited number of computational solver services on a heterogeneous network, maintaining all their service status and job statistics.
- Intelligently schedules computational jobs onto available solver services
- Intelligently allocating computing resources to different jobs
- Synchronous and asynchronous scheduler/solver invocation
- Actively running job queue management
- Finished/killed job management
- Large Result Storage
- User management related to their job submission
- Killing long jobs over the remote server
- Checking and managing scheduler/solver service status and job statistics
- Persistence between service starts
- Job dependency and sequencing handling



OS REGISTRY

- Remote collection of service statistics and job information from potentially unlimited number of computational solver services on a heterogeneous network.
- Automatically finding available computational services for client agents
- On-line and off-line registration of new computational services
- Dynamic update and deletion of registered services
- Easily plugged with ACE scheduler server to provide a mixed centralized and decentralized distributed system
- Intelligently finding computing resources to different jobs
- Checking and managing registry service status and job statistics
- Persistence between registry server starts
- Registry service logging
- Centralized user configuration
- Directory and file cleanup
- Disk, memory and process cleanup
- Critical data backing up
- Keeping track of service utilization and preparing periodic detailed and summary reports
- Automatic input and output validation
- Remote User control
- Support of all major operating systems
- Authentication and authorization
- Security



Business Values

Solve more types of computational problems more efficiently

Easily deploy enterprise computing system within a company, with intelligent components in scheduling computational jobs, registering and finding computing services, routing maintenance

Provide computational software as services on dedicated servers

Let all computational software communicate with each, independent of platforms and implementations.

Save costs on expensive software licenses

Make full use of limited computational solvers

